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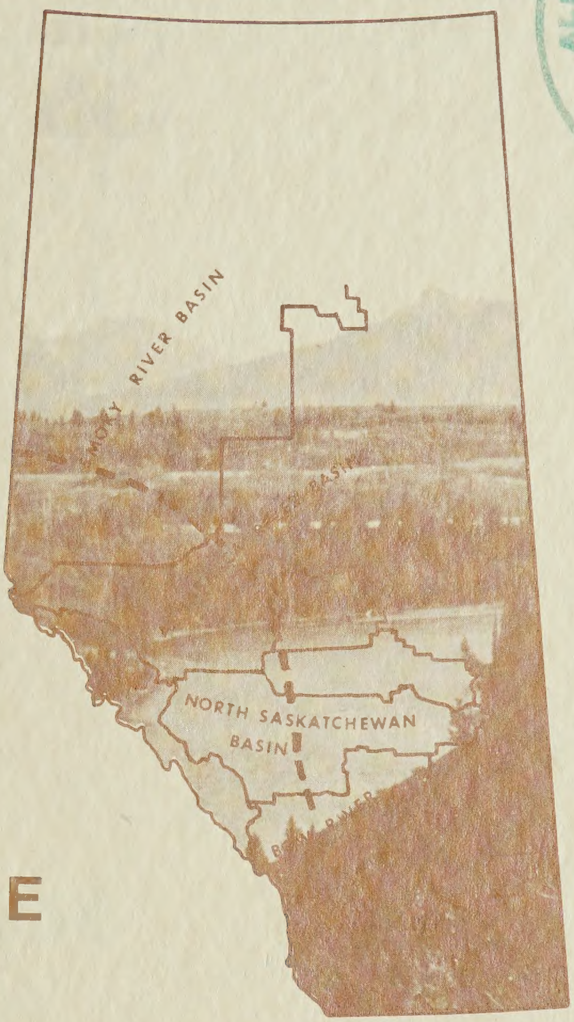

LAND USE
and
RESOURCE DEVELOPMENT
in the
EASTERN SLOPES

BOW RIVER WATERSHED BASIN

REPORT BY CALGARY
REGIONAL PLANNING COMMISSION

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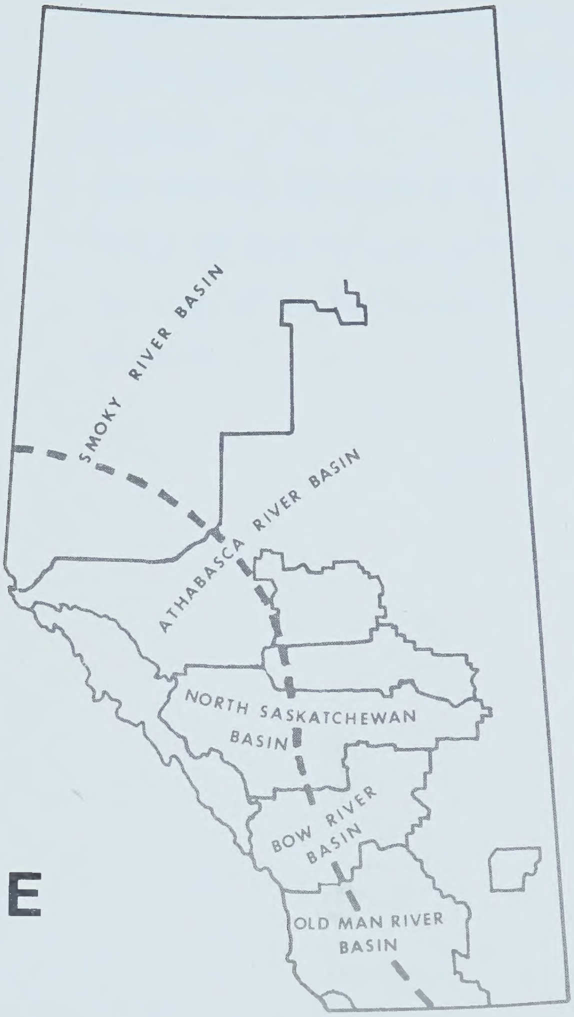

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REPORT BY CALGARY
REGIONAL PLANNING COMMISSION

ENVIRONMENT CONSERVATION AUTHORITY
9912 - 107th Street, EDMONTON, ALBERTA, T5K 1G5

MAY, 1973

The Environment Conservation Authority presents this publication as background information for its upcoming public hearings.

This material was prepared by an outside agency and does not necessarily express the views of the Environment Conservation Authority.

THE BOW RIVER WATERSHED BASIN

AN INFORMATION PAPER

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1. INTRODUCTION

The Government of Alberta through the Environment Conservation Authority is to hold public hearing on land use and resource development in the Eastern Slopes of the Rocky Mountains and the Foothills Area of Alberta. The Authority has defined this region as:-

> the total mountain and foothills areas in the Province from its western and northwestern borders with British Columbia and its southern border with Montana to the eastern limits of the foothills but not including the National Parks and Indian Reservations.[1]

The Authority notes that in the Eastern Slopes land is used or may be used for such purposes as:-

> tourism, summer and winter recreation, urban development, forest utilization, mineral resource industries, surface mining, oil and gas development, under-ground coal mining, agriculture, watershed conservation, domestic water supplies, hydroelectric power developments, wildlife and fishery management, wilderness and natural areas, institutional use (charitable and religious groups), archaeological sites, research, etc.

Public hearings are intended to serve as a vehicle

i) to enquire into all existing and potential uses and to formulate ways in which optimum benefits and environment conservation can be achieved, now and for the future, from the various resources of the Eastern Slopes;

ii) to consider and evaluate the views of the public on specific recreational and tourist development proposals for the region; and

---

[1] Introductory details are extrapolated from the Environment Conservation Authority's Information Bulletin, Public Hearings on Land Use and Resource Development in the Eastern Slopes. Edmonton, 1972.

iii) to lay the views presented to the Authority and the Authority's findings and recommendations before the Government of Alberta.

The Eastern Slopes have a distinctive physiographic and biological environment. This together with the region's history of land use, its apparent potential for resource development and the fact that it is mainly public (Crown) land managed by government agencies suggest common alternatives for future land use. However, the region is vast. Land uses are often evaluated more in terms of local needs and aspirations. For example, major streams may be regulated to accommodate downstream requirements.

To facilitate this more local interest the Environment Conservation Authority will receive submissions on proposed integrated developments in the five major watershed basins which make up the Eastern Slopes. These watersheds are: the Oldman, Bow, North Saskatchewan, Athabasca and Smoky. This paper is concerned exclusively with an examination of part of the Bow River Watershed Basin.

2. AIMS OF THE PAPER

The aims of the paper are:-

i) to identify the principal geographical features and natural characteristics of the area;

ii) to describe the administrative and land use history of the area;

iii) to describe present land dispositions and land uses;

iv) to describe some aspects of landscape change;

v) to outline ongoing resource potential evaluation;

vi) to pose some questions concerning planning for future land use and resource development; and

vii) to suggest additional reference materials.

The paper is not intended to be an analysis of conditions, past or present, in the Bow River Watershed Basin. Neither does it seek to express preferences for future land uses in the area. It is simply a general information paper. By touching on several aspects of land use and resource development the paper may assist individuals and organizations in making contributions at public hearings.

3. THE STUDY AREA

The portion of the Bow River Watershed Basin discussed in this paper is shown in Figure 1. The study area ("the area") includes the Bow River and its tributaries situated between the eastern boundary of Banff National Park to the west and the western boundaries of the Municipal Districts of Rocky View No. 44 and Foothills No. 31. To the north the boundary is the watershed divide between the Ghost River drainage and the Red Deer River drainage. The southern limit is marked by the watershed divide between the Highwood River drainage and the Livingstone River drainage. These boundaries generally divide the unsettled public lands of the area from settled private lands.

An important part of the area is the Canmore Corridor which is here defined as that part of the Bow River valley lying between the eastern boundary of Banff National Park and Seebe, and including the mountains surrounding the valley. The Corridor is settled and contains substantial amounts of privately owned land.

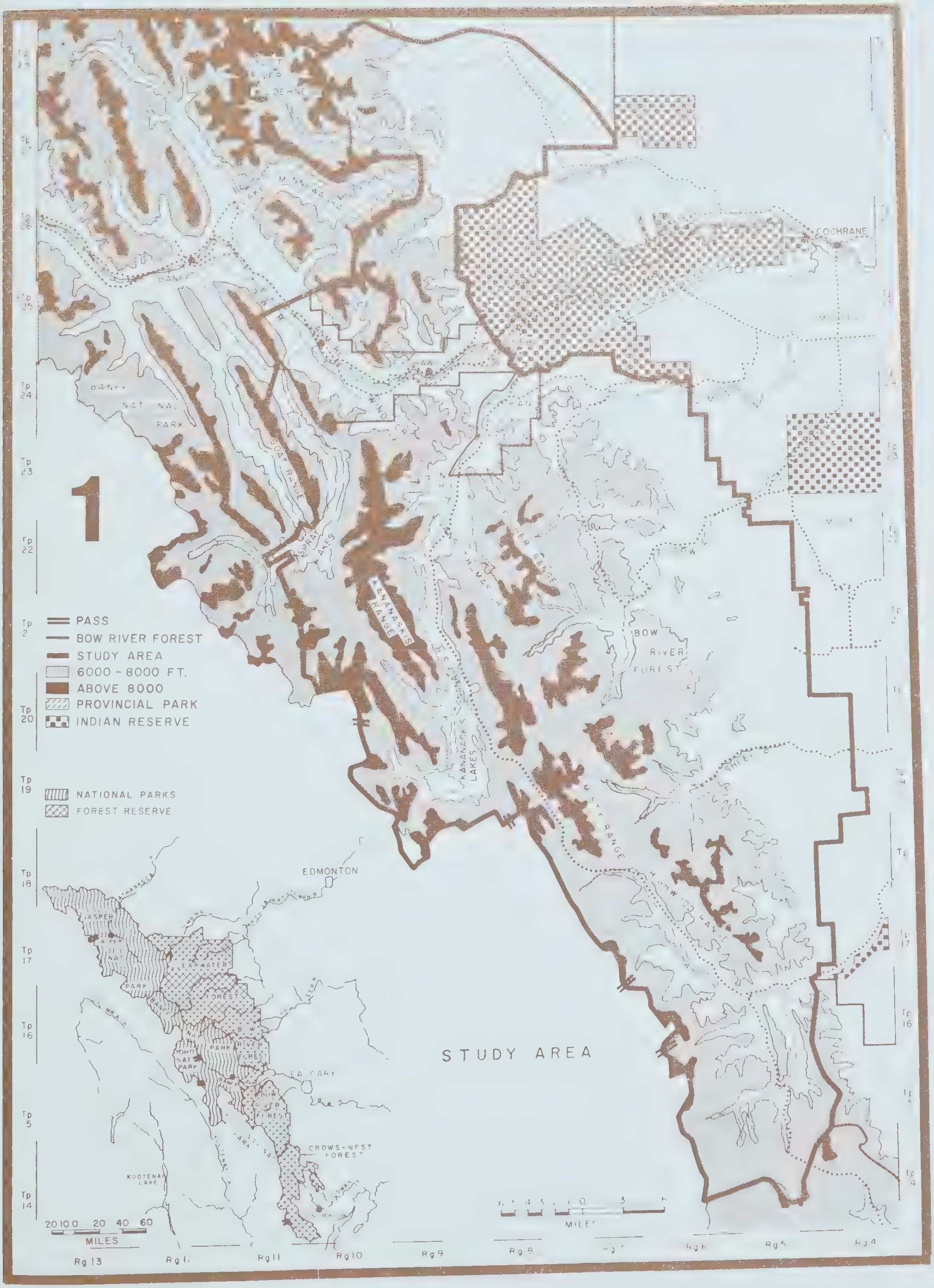
4. GEOGRAPHICAL DESCRIPTION

In this section the location, physical relief, drainage, geology and geomorphology of the study area are briefly discussed.

4.1 Location

The Bow River Basin is readily accessible to Alberta residents and out-of-province visitors. The Canmore Corridor is but a four-hour drive or less from most of Alberta's major urban centres. The Corridor is only about one hour's drive from Calgary, a rapidly growing city of 425,000. Nearby Banff townsite and the Rocky Mountain national parks attract an international tourist clientele.

The Trans-Canada Highway (No. 1), the 1A Highway and the Canadian Pacific Railway (C.P.R.) bisect the area from east to west, thereby making this segment of the Bow Valley a nationally important transportation route. The


1
PASS
BOW RIVER FOREST
STUDY AREA
6000 - 8000 FT.
ABOVE 8000
PROVINCIAL PARK
INDIAN RESERVE
NATIONAL PARKS
FOREST RESERVE
COCHRANE
BANFF
BANFF NATIONAL PARK
GOAT RANGE
SPRAY LAKES
KANANASKIS RANGE
KANANASKIS LAKES
BOW RIVER FOREST
MISTY RANGE
STUDY AREA
EDMONTON
JASPER NAT PARK
CLEARWATER FOREST
BANFF NAT PARK
BOW RIVER FOREST
YOHO NAT PARK
CALGARY
CROWS-NEST FOREST
KOOTENAY LAKE
20 10 0 20 40 60
MILES
MILES
Tp 25
Tp 24
Tp 23
Tp 22
Tp 20
Tp 19
Tp 18
Tp 17
Tp 16
Tp 14
Rg 13
Rg 12
Rg 11
Rg 10
Rg 9
Rg 8
Rg 7
Rg 6
Rg 5
Rg 4

gravel surface Forestry Trunk road, parts of which are being improved, links Morley with Hinton and Kananaskis with Coleman. This is the principal north-south route.

An excellent system of hardtopped highways through the Rocky Mountain national parks provides access from various points in Alberta and British Columbia. Additional roads to and through the area could be developed by improving the existing network of rough and seasonally impassable forestry roads. Routes which might be upgraded include the one linking Jumpingpound Creek with the Elbow River, the rough track along the course of Smith-Dorien Creek, and the route which crosses Elk Pass to the Elk River in British Columbia.

The area is also accessible to a continental and international population through Calgary's International Airport. The airport is now being expanded to accommodate the largest types of commercial aircraft. The little-used airstrip at Banff will disappear when the Trans-Canada Highway is four-laned through Banff National Park. The development of a new airstrip in the Canmore Corridor is under active discussion by interested organizations.

In sum the Bow River Watershed Basin may be reached by road, rail and air. Opportunities exist to improve this accessibility. The nature of communication links which are eventually developed may greatly influence plans for land use both in the area itself and in lands adjacent to it.

4.2 Topography

The topography of the area is varied. Rolling, wooded hills where relief is generally less than 6,000 feet characterize the foothills along the eastern and north-eastern boundaries. There are occasional stretches of relatively flat land (e.g. Morley Flats). For the most part, however, the terrain is rugged. A series of high, parallel northwest-southeast mountain ridges (the Front Ranges: e.g. Kananaskis, Opal, Misty Ranges) are separated by deep river valleys.

Slopes on the eastern margins of the area are relatively gentle. Where the terrain becomes more pronounced towards the west, steep and often near vertical slopes prevail.

4.3 Drainage

The principal streams draining the area are the Ghost, Bow, Kananaskis, Elbow, Sheep and Highwood Rivers (Fig. 1). In addition to numerous smaller, permanent streams there are many intermittent watercourses. The main lakes in the area have been either created or enlarged by man for hydroelectric power production purposes (Spray and Kananaskis Lakes and Barrier and Ghost Reservoirs).

4.4 Geology and Geomorphology

The mountains and foothills of Southwestern Alberta form part of a huge anticline whose apex lies at the Alberta-British Columbia border. The rocks of the mountains are mainly Palaeozoic limestones, dolomites and quartzites. Rocks of the lower foothills consist of Mesozoic shales, sandstones and conglomerates. Strata is progressively older westward. Differential erosion has helped to produce the series of parallel and sub-parallel northwest-southeast trending fault ridges noted above.

Glacial and glacio-fluvial activity has contributed many features familiarly associated with the presence of ice and water. U-shaped valleys, drift deposits which now form valley terraces, moraines, kames and outwash plains are to be found in the area.

Geological strata such as the Kootenay formation of the Upper Cretaceous and unconsolidated deposits of sands and gravels have made possible some of the industrial activities described below.

4.5 Climate

Alberta's climate is on the whole continental. Cold winters and short, cool summers generally prevail. Latitude, altitude and location are important influences upon the climate of the area. There are considerable variations in climate from district to district, as well as in the weather from year to year.

At the Kananaskis Forest Experiment Station the mean maximum temperature for July, the warmest month, is 55.7°F. The mean January temperature is 16.7°F. and the annual total precipitation is 23.45". On higher valley slopes in the Marmot Creek Experimental Watershed temperatures range as low as -45°F. and as high as 86°F. Precipitation totals about 45".

Climatic factors influence many aspects of land use. For instance low water temperatures, low overnight summer temperatures, the impact of warming Chinook winds on ski slopes all suggest possible climatic restrictions on the location and scale of certain recreational activities.

4.6 Soils

Soils throughout the area are complex. They vary particularly from the higher elevations and intermountain valleys in the west to the rounded foothills in the east. Six descriptive terms have been applied by the Eastern Rockies Forest Conservation Board for management purposes: bare rock and rocky alpine; residual; colluvial; glacial; alluvial and glacio-fluvial; and bog and marsh. Podzolic soils are found on many of the lower elevations. They have developed under forest cover where leaf litter accumulates on the surface.

While in general the soils are well drained and erosion resistant, certain land uses have contributed to increased instability. Overgrazing is one cause, leading also to diminished range carrying capacity. Poor road and seismic line construction produces heavy gullying and stream siltation. In turn aquatic environments have been disturbed and some fish populations have reportedly declined.

4.7 Vegetation

The area lies in a transition zone between the parkland vegetation of the Prairies and the alpine vegetation of the Front Ranges. Rough fescue grass dominates the lower foothills. In the higher foothills there is a forest of climax white and black spruce with successional lodgepole pine, aspen and balsam poplar and black cottonwood. River valley bottoms support mixed stands of poplar, white spruce, Douglas fir, lodgepole pine, limber pine, willow and white birch.

The alpine forest cover of the highest mountain elevations is made up primarily of conifers which sweep up from the lower slopes to timberline at about 6,500 feet. As elevation increases so does alpine fir tend to mix more and more with Engelmann spruce and lodgepole pine. Towards timberline whitebark pine and alpine larch become evident.

All of the Eastern Slopes have had an extensive fire history, in large measure contributing to today's dominant, fire-following sub-climax lodgepole pine forest. Since about 1910, protection of forest cover has been one of the principal land management objectives of respective administrative agencies.

4.8 Fish

Fish populations are found in all of the rivers of the area as well as in several of the smaller streams, natural lakes, beaver dams and the reservoirs. Game fish which occur naturally or which have been stocked include rainbow trout, eastern brook trout, brown trout, Dolly Varden trout (bull trout), cutthroat trout, lake trout and Rocky Mountain whitefish (grayling).

Non-game fish which are common include suckers and ling (burbot). Warm-water game fish are absent. Low water temperatures inhibit their production and upstream movement is denied by man-made dams.

4.9 Wildlife

Three faunal zones may be found in the area. The Alpine zone is restricted to the treeless, relatively barren lands of the Front Ranges which lie above timberline. Bighorn sheep and mountain goat are most prominent amongst the larger mammals although an occasional grizzly bear or wolverine may also be present. Chipmunks, pikas and marmots frequent rockslides.

The Hudsonian-Canadian (subalpine) zone is transitional, lying between the stunted alpine fir and larch growth near timberline and the biologically rich Canadian zone with which it merges on the eastern margins of the area. Because boundaries between these two zones are flexible, several wildlife species common to both are distributed over much of the area.

Big game includes whitetail and mule deer, elk and moose, black and grizzly bear and bighorn sheep. Some wolves may be present. Fur bearers such as beaver and marten are present and smaller species include chipmunks, voles and shrews. A band of feral (wild) horses ranges over parts of the Sheep and Elbow River drainages.

The number and condition of winter ranges are crucial to the maintenance of wildlife populations. Several such ranges exist. Bighorn sheep ranges lie adjacent to Banff National Park north of the Canmore Corridor and in several locations south of the Bow River. Portions of the Ghost, Elbow and other river valleys opening to the east are important winter ranges for elk and mule and whitetail deer.

5. ADMINISTRATION AND LAND USE

In this section the principal administrative categories of lands in the area are described. The disposition of land is outlined. An account of past and present uses is provided. Then some landscape changes wrought by these land uses are discussed.

Since the onset of permanent white settlement in southwestern Alberta in the late nineteenth century the Eastern Slopes have had a history of multiple land use. That is, the natural resources of the region have been managed by different agencies so as to permit mining, lumbering, grazing, watershed conservation and other types of land use at the same time. Priorities for land use have been ascribed in most instances. Occasionally considerable landscape change has resulted from the extraction of both renewable and non-renewable resources.

5.1 Administration

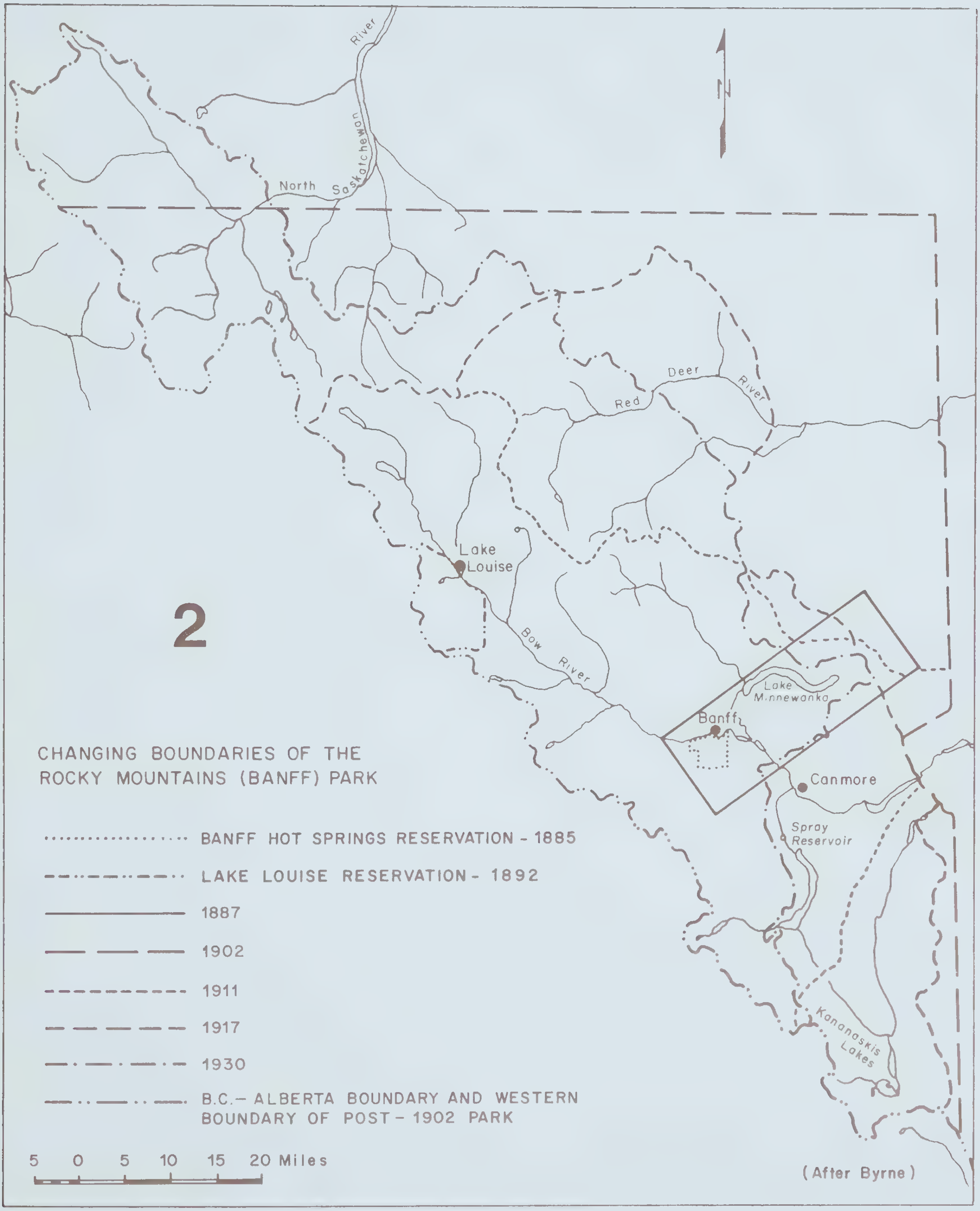
The first major administrative unit to include part of the area was Banff National Park. In 1902 the existing park boundary was expanded to include the Spray and Kananaskis Valleys, the Canmore Corridor and other lands (Fig. 2). Further boundary revisions were made in 1911, 1917, 1930 and 1949.

The park was enlarged mainly for the purposes of recreation and game protection, but national park status did not prohibit land uses such as lumbering and mining until the National Parks Act was passed in 1930. At that time the park boundary was withdrawn westward and excluded areas of industrial activity in the Canmore Corridor.

The Spray and Kananaskis Valleys, the Canmore Corridor and its surrounding mountains continued to be a game reserve administered by the Government of Alberta. This status was withdrawn in 1956.

Perhaps the single most significant development in the land use history of the Eastern Slopes was the establishment in 1910 of the Rocky Mountains Forest Reserve by the Dominion Government. Rapid settlement of the relatively dry, treeless Prairies in the two decades following the completion of the C.P.R. in 1885 produced a need for both timber supplies and irrigation waters. Although the Department of the Interior had recognized the need for conservation on non-agricultural public lands, extraction of timber from the Bow, Spray, Kananaskis and other valleys was careless, wasteful and the cause of many major fires. Watershed stability and the equable flow of water for irrigation and other purposes was threatened.

Eventually the Forest Reserve was established "for the maintenance, protection and reproduction of the timber... the conservation of the minerals and the protection of the animals, birds and fish therein, and for the maintenance of conditions favourable to a continuous water



2

CHANGING BOUNDARIES OF THE ROCKY MOUNTAINS (BANFF) PARK

(After Byrne)

supply..."[1] Mining, grazing and recreation were among the uses permitted. The reserve was administered by the Dominion Forestry Branch.

With the transfer of natural resources to Alberta in 1930 the Forest Reserve became a provincial responsibility. The area was administered by the Department of Lands and Mines. The purposes of the reserve, however, remained identical to those formulated by the Dominion Government.

In 1947 the Eastern Rockies Forest Conservation Board was created. Officials were drawn from the Governments of Canada and Alberta. The purposes of the Board were:-

i) to construct, operate and maintain and to supervise the construction, operation and maintenance of projects and facilities required for the conservation of the forests and the protection of the watersheds in an area[2] forming part of the Rocky Mountains Forest Reserve;

ii) to protect the forests in the Area from fire, insects, disease and other damage; and

iii) to conserve, develop, maintain and manage the forests in the Area with a view to obtaining the greatest possible flow of water in the Saskatchewan River and its tributaries.[3]

The Board has "adhered to the principle that watershed protection and improvement may be attained along with the utilization of the other resources, hence a policy of managing the Conservation Area on a multiple-use basis has been accepted".[1] In 1964 the Board stated as part of its policy that it would not promote or encourage recreational use of the Conservation Area and that such use would be restricted in large sections of the reserve.[2]

---

[1] Canada. Statutes. 1911. An Act respecting Forest Reserves and Parks. 1-2 George V, Chap. 10.

[2] The Conservation Area contains about 9,000 square miles on the Eastern Slopes bounded by Waterton, Banff and Jasper National Parks and by the Brazeau-Athabasca divide.

[3] Eastern Rockies Forest Conservation Board, 1972. Annual Report.

Administration and operation of the Board's program has been the responsibility of the Alberta Forest Service. The Board is to be disbanded this year.

5.2 Land Disposition

There are three principal types of land holdings in the area. These are unencumbered public land, public land held under a system of leases and permits and private land. Leases and permits have been issued for a variety of purposes including coal, petroleum and natural gas exploration and extraction, quarrying, grazing and timber cutting, recreation and miscellaneous residential, hydro-electric and communications activities.

[1] Ibid.

[2] Eastern Rockies Forest Conservation Board, 1964. "Recreation. General Policy Statement". (mimeographed).

Leases may contain renewal clauses. They are sometimes long-term and they may apply either to the surface or subsurface resources. Some leases have been issued quite recently; for example, that issued to the Alpine Club of Canada for a clubhouse in the Canmore Corridor. Other arrangements date back to the first years of this century, such as some coal and grazing leases and permits.

Land disposition is at its most complex in the Canmore Corridor (Fig. 3). Permanent communities, such as Harvie Heights, Canmore, Exshaw, Kananaskis and Seebe as well as a scattering of service centres, add to the distinctiveness of land dispositions there.

This pattern of land ownership could change significantly over a short time period. Decisions on several applications for development have been tabled by the Calgary Regional Planning Commission pending the outcome of public hearings. If approved, these applications would require changes in the existing legal status of the lands involved.

5.3 Watershed Conservation

As noted above, this is the principal objective of land use management. Although only about 12% of the Saskatchewan River basin lies in the mountains, about 87% of the total annual flow comes from the Eastern Slopes and the national parks.

5.4 Coal Mining

Coal seams were discovered in the Kootenay formation of the Cascade Coal Area in 1883. Canmore was established as a coal mining town and by 1914 an area from Lake Minnewanka to Evans-Thomas Creek had been patented or reserved for coal mining purposes. Intermittent mining occurred at other sites (e.g. Ribbon Creek, 1947-52), but the Canmore Corridor has remained the focus of this land use.

Most of the private land on the south side of the Canmore Corridor (i.e. about 5725 acres) is owned by Canmore Mines Ltd. which also leases an additional 2850 acres. Underground mining has been the usual method of coal extraction, but in the Corridor and elsewhere there have been some experiments with surface stripping.

The present disposition of coal leases and coal exploration reservations is shown in Figure 4.

5.5 Timber Cutting

This part of the Eastern Slopes is not recognized as an abundant source of merchantable[1] timber. The Alberta Forest Service reports that 58% of the merchantable timber in the Eastern Slopes is composed of lodgepole pine. Parts of the area are designated as "protection forest"

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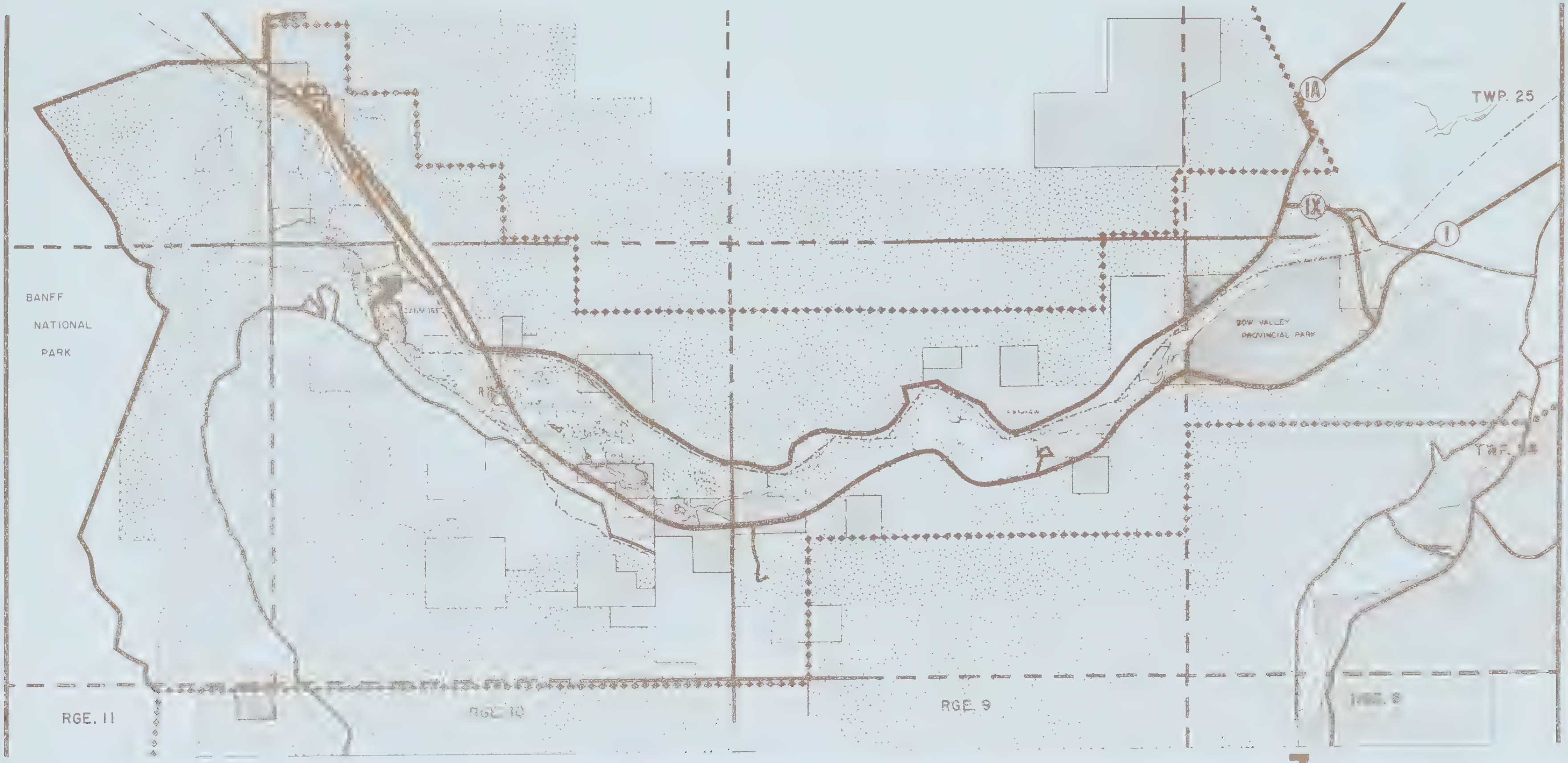
[1] "Merchantable" is defined as trees with diameters greater than 4".



LEGEND

◆◆◆◆◆◆	forest reserve boundary
▨	public land with leases (miscellaneous grazing, mining, etc.)
☐	public land unencumbered
	private land

3

CANMORE CORRIDOR

LAND DISPOSITION

because of their importance to watershed stability and are unavailable for timber cutting.

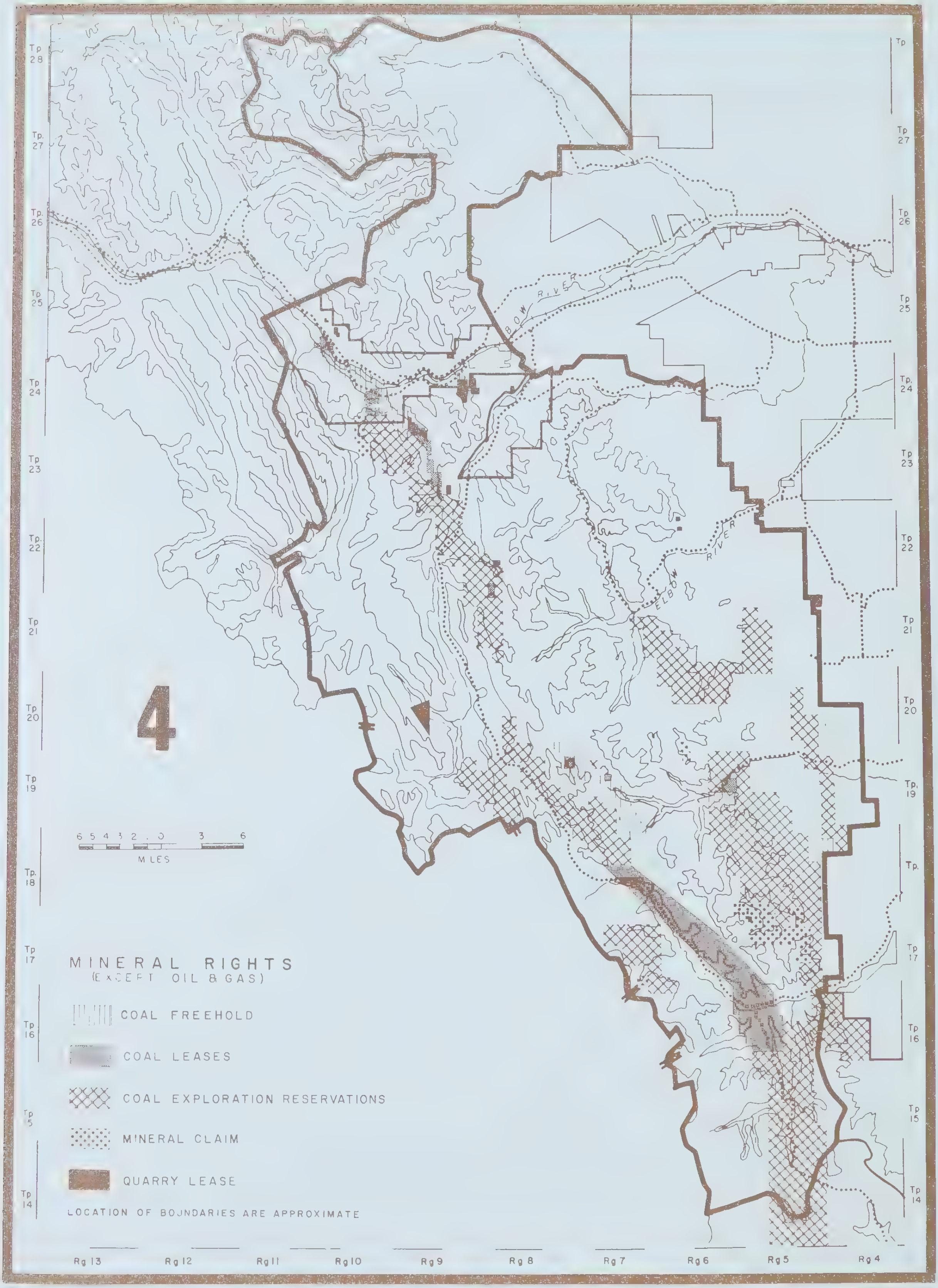
The forest resource has been used constantly by individual permittees for the production of poles, posts and saw timber. Commercial activities are today confined to two principal districts (Fig. 5).

Timber cutting rights were first sold in the 1880's. From then until 1966 the principal method of timber disposal was to sell timber licences to the highest bidder. Current timber dispositions are made in the form of quotas and annual cuts within management units administered by the Alberta Forest Service.[1] The object aimed at is sustained yield forestry.

5.6 Grazing

Domestic stock grazing has been a traditional use in the foothills. Today the only areas closed to grazing include the Fairholme Range and the Spray-Kananaskis drainage district. The Bow River Forest is divided into grazing allotments for management purposes. These allotments, their acreages and carrying capacities are shown in Figure 5.

[1] Alberta Forest Service, 1972. The Quota System of Timber Disposal. Edmonton.


4
MINERAL RIGHTS
(EXCEPT OIL & GAS)
COAL FREEHOLD
COAL LEASES
COAL EXPLORATION RESERVATIONS
MINERAL CLAIM
QUARRY LEASE
LOCATION OF BOUNDARIES ARE APPROXIMATE
6 5 4 3 2 1 0 3 6
MILES
BOW RIVER
ELBOW RIVER
Tp 28
Tp 27
Tp 26
Tp 25
Tp 24
Tp 23
Tp 22
Tp 21
Tp 20
Tp 19
Tp 18
Tp 17
Tp 16
Tp 15
Tp 14
Rg 13
Rg 12
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Rg 10
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Rg 7
Rg 6
Rg 5
Rg 4

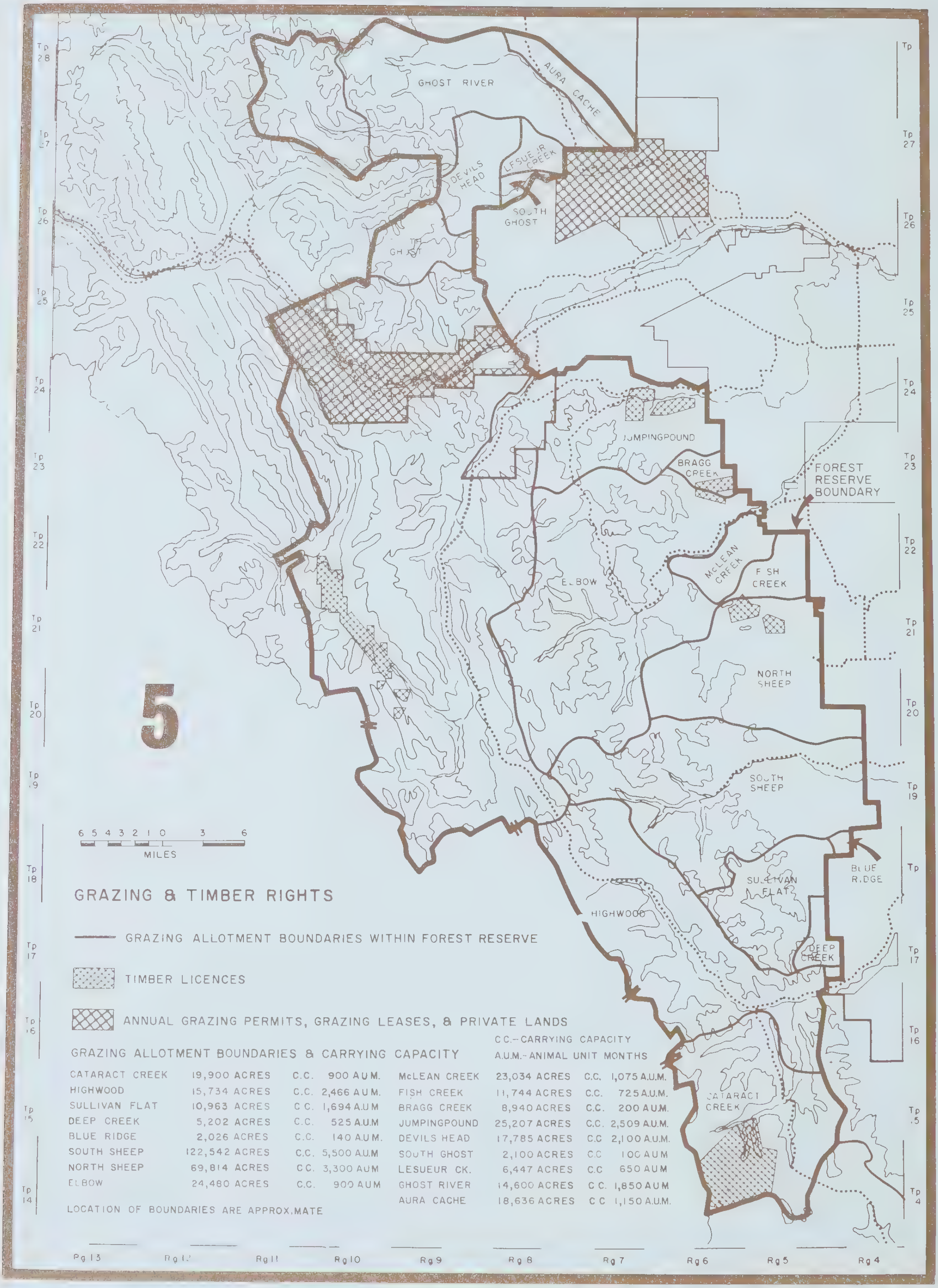
5.7 Quarrying

The following are a few examples of non-metallic mineral extraction in the area. Limestone from Exshaw has been quarried for over 60 years for the manufacture of Portland cement. At a plant at Kananaskis, Cambrian limestone is quarried for the manufacture of lime and crushed stone products. Hard black shale from the Wapiabi formation is quarried at Seebe.

There are extensive reserves of sand and gravel throughout the area. Gravel pits have been opened in the Canmore Corridor and along the routes of highways for the purposes of railway ballast, road construction and so on. Possibly still more sites may be opened with expanded road building. Also, Parks Canada may pursue a policy which precludes further extraction of sands and gravels from locations inside national parks.

5.8 Oil and Gas

Portions of the area have been leased or reserved for the purposes of geophysical exploration and oil and gas development. However, the principal fields identified by Alberta's Energy Resources Conservation Board are peripheral to the area (Fig. 6). During the fiscal year 1971-72, there were 36 producing wells in the Bow River Forest. Twelve wells were drilled and nine were abandoned.



5

GRAZING & TIMBER RIGHTS

— GRAZING ALLOTMENT BOUNDARIES WITHIN FOREST RESERVE

▨ TIMBER LICENCES

▩ ANNUAL GRAZING PERMITS, GRAZING LEASES, & PRIVATE LANDS

C.C.– CARRYING CAPACITY
A.U.M.– ANIMAL UNIT MONTHS

GRAZING ALLOTMENT BOUNDARIES & CARRYING CAPACITY

CATARACT CREEK	19,900 ACRES	C.C.	900 A.U.M.	McLEAN CREEK	23,034 ACRES	C.C.	1,075 A.U.M.
HIGHWOOD	15,734 ACRES	C.C.	2,466 A.U.M.	FISH CREEK	11,744 ACRES	C.C.	725 A.U.M.
SULLIVAN FLAT	10,963 ACRES	C.C.	1,694 A.U.M.	BRAGG CREEK	8,940 ACRES	C.C.	200 A.U.M.
DEEP CREEK	5,202 ACRES	C.C.	525 A.U.M.	JUMPINGPOUND	25,207 ACRES	C.C.	2,509 A.U.M.
BLUE RIDGE	2,026 ACRES	C.C.	140 A.U.M.	DEVILS HEAD	17,785 ACRES	C.C.	2,100 A.U.M.
SOUTH SHEEP	122,542 ACRES	C.C.	5,500 A.U.M.	SOUTH GHOST	2,100 ACRES	C.C.	100 A.U.M.
NORTH SHEEP	69,814 ACRES	C.C.	3,300 A.U.M.	LESUEUR CK.	6,447 ACRES	C.C.	650 A.U.M.
ELBOW	24,480 ACRES	C.C.	900 A.U.M.	GHOST RIVER	14,600 ACRES	C.C.	1,850 A.U.M.
				AURA CACHE	18,636 ACRES	C.C.	1,150 A.U.M.

LOCATION OF BOUNDARIES ARE APPROXIMATE

5.9 Scientific Research

Some public lands have been allocated to scientific research. Since 1934, 494 acres of the lower Kananaskis Valley have been used as a silvicultural experiment station by the Canadian Forestry Service. Part of this area is also used by the University of Calgary for its Environmental Sciences Centre. The Marmot Creek Experimental Watershed was set aside in 1962 as a cooperative watershed research area involving 13 federal and provincial agencies and the Universities of Alberta and Calgary.

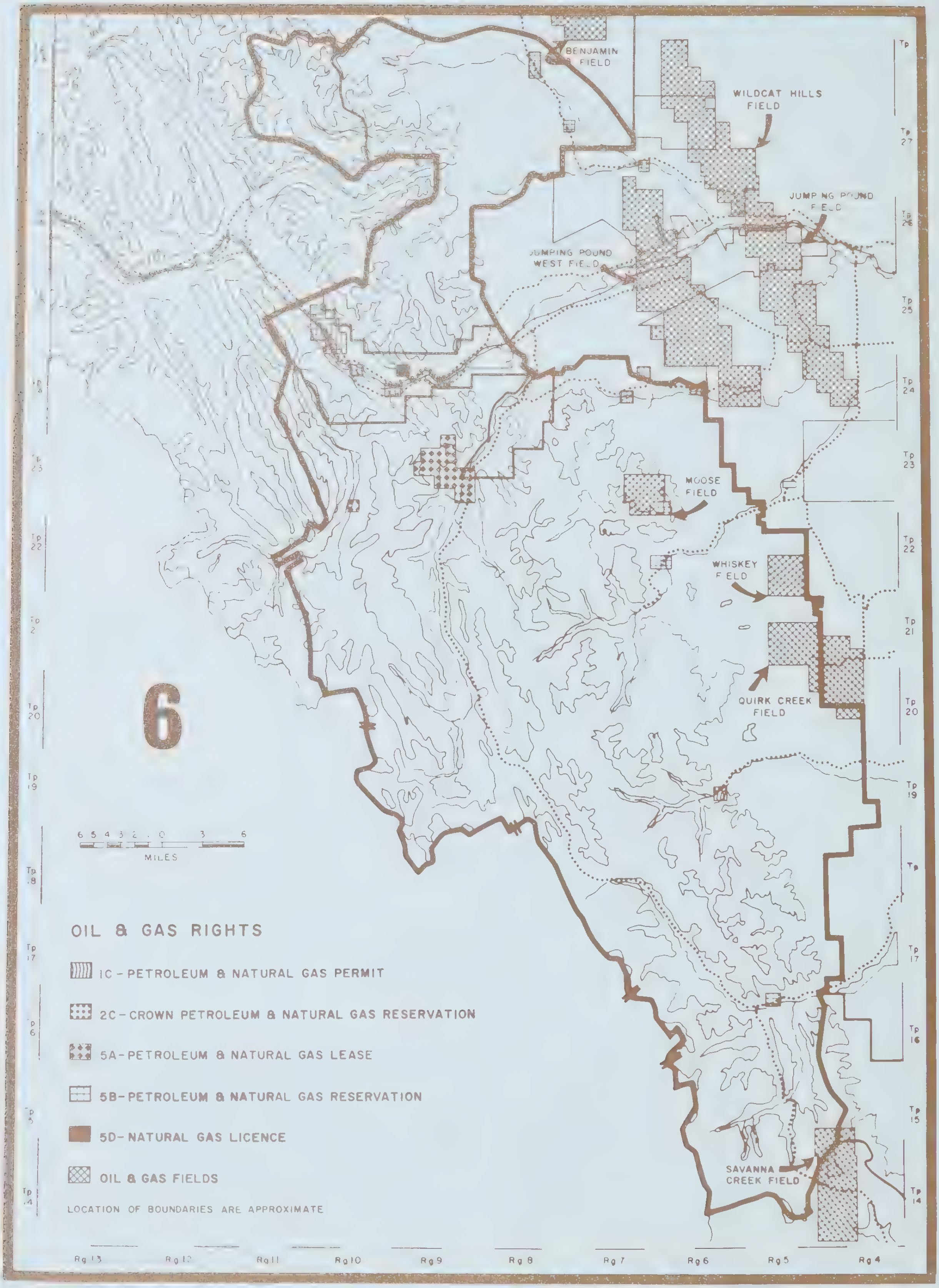
5.10 Recreation

Recreational land uses may be divided into two categories: those which require some form of facility development and those which do not.

i) Facilities-Oriented Recreation

There are six summer cottage developments (Fig. 7). Benchlands, Ghost and Waiparous were developed in the 1930's and 1940's and extended in the early 1960's. During the 1950's and 1960's new subdivisions were opened at Harvie Heights, Kananaskis Lakes and Lac des Arcs. The cottage subdivisions are on both public and private land.

The provincial government has located picnic sites and campgrounds along the main routes in


6
BENJAMIN FIELD
WILDCAT HILLS FIELD
JUMPING POUND FIELD
JUMPING POUND WEST FIELD
MOOSE FIELD
WHISKEY FIELD
QUIRK CREEK FIELD
SAVANNA CREEK FIELD
6 5 4 3 2 1 0 3 6
MILES
OIL & GAS RIGHTS
1C - PETROLEUM & NATURAL GAS PERMIT
2C - CROWN PETROLEUM & NATURAL GAS RESERVATION
5A - PETROLEUM & NATURAL GAS LEASE
5B - PETROLEUM & NATURAL GAS RESERVATION
5D - NATURAL GAS LICENCE
OIL & GAS FIELDS
LOCATION OF BOUNDARIES ARE APPROXIMATE
Tp 27
Tp 26
Tp 25
Tp 24
Tp 23
Tp 22
Tp 21
Tp 20
Tp 19
Tp 18
Tp 17
Tp 16
Tp 15
Tp 14
Rg 13
Rg 12
Rg 11
Rg 10
Rg 9
Rg 8
Rg 7
Rg 6
Rg 5
Rg 4

the area and on roads which lead into the foothills. Two sites are located in provincial parks. Most of the facilities are in proximity to water surfaces.

Private recreational facilities are available in the Canmore Corridor and in the Kananaskis Valley in the form of ski hills and dude ranches. Additional recreational facilities are being made available on the Stony Indian Reserve.

The area is popular with institutional groups from Calgary. The Youth Hostel at Ribbon Creek is one such example.

ii) Non-Facilities-Oriented Recreation

There are several recreational activities which do not require the provision of facilities other than access roads and trails. These include recreational driving, cross-country skiing, snowshoeing, snowmobiling, hiking and backpacking, boating, hunting and fishing. All are undertaken to some degree in the area.

Restrictions have been imposed upon the types of activities which may be carried on in some areas. For example, hunting and fishing is not permitted in the Ghost River Wilderness Area.

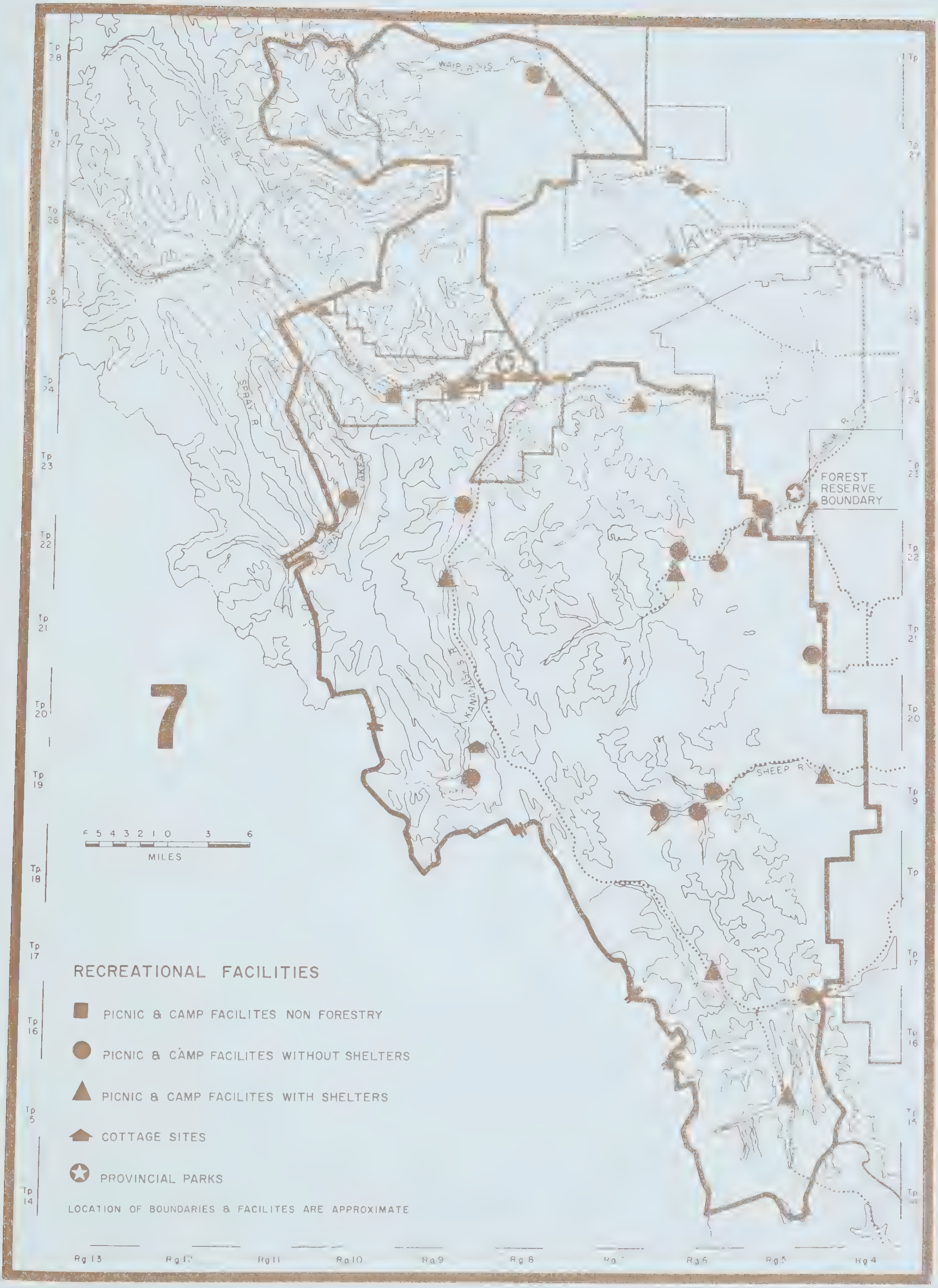
Elsewhere, several species are hunted. The area lies mainly in three game zones. B.G. 7 lies north of the Fairholme Range and the Indian Reserve. B.G. 8 which is exclusively a bow and arrow zone, includes the Canmore Corridor. B.G. 9 makes up the balance of the area lying south of the Bow River Valley.

In 1972 provincial game regulations permitted the hunting of male and/or female whitetail and mule deer, moose and elk, bighorn sheep, black and grizzly bears in these zones.

As indicated before, there are several game fish present. While there is general public access to most waters in the public lands in the area, in the case of the Bow River a definite access problem exists. 49.5 miles, of a total of 71 miles of the Bow River between Calgary and Banff National Park, lie on private lands or Indian Reserve.

5.11 Hydroelectric Power Production

Calgary Power Ltd. began providing hydroelectricity in 1911. Since then the company's activities have encompassed developments at Spray Lakes, Kananaskis Lakes, the Canmore Corridor and at various sites along the Bow and Kananaskis Rivers.

7
FOREST
RESERVE
BOUNDARY
SPRAY R
SPRAY L
KANANASKIS R
SHEEP R
5 4 3 2 1 0 3 6
MILES
RECREATIONAL FACILITIES
■ PICNIC & CAMP FACILITES NON FORESTRY
● PICNIC & CAMP FACILITES WITHOUT SHELTERS
▲ PICNIC & CAMP FACILITES WITH SHELTERS
☗ COTTAGE SITES
✪ PROVINCIAL PARKS
LOCATION OF BOUNDARIES & FACILITES ARE APPROXIMATE
Tp 28
Tp 27
Tp 26
Tp 25
Tp 24
Tp 23
Tp 22
Tp 21
Tp 20
Tp 19
Tp 18
Tp 17
Tp 16
Tp 15
Tp 14
Rg 13
Rg 12
Rg 11
Rg 10
Rg 9
Rg 8
Rg 7
Rg 6
Rg 5
Rg 4

5.12 Other Uses

Additional uses which must be considered in planning include permanent residential developments, notably the communities in the Canmore Corridor, and transportation routes.

5.13 Landscape Change

The location and scale of some land uses may bring about changes in landscapes and ecosystems both inside and outside the area. A recent example showed parts of Banff National Park to be open to accidental flooding from the Spray Lakes Reservoir.

Occasionally changes can be predicted as in the case of fish productivity in artificial reservoirs.[1] Other changes may result from inadequate knowledge of the consequences of some land uses on other components of the landscape, or simply from poor management practices.

Because fire protection has been so stringent in recent decades no major fires have occurred in the area since the 1930's. While this control satisfies the objectives of watershed conservation it has also encouraged the expansion of coniferous forest into open grassland and aspen stands. The carrying capacity of the forest for big game has been reduced.

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[1] D. McDonald, 1972. "Recreational Potential of the Bow River Valley". (mimeographed).

Industrial activities such as mining, quarrying and lumbering have brought changes in the landscape, particularly in the Canmore Corridor where the mix of land uses is largely confined to the valley floor.

Specific examples of problems associated with multiple land use have been documented in the Conservation Guides prepared for each of the principal drainage basins by the Eastern Rockies Forest Conservation Board.

6. EVALUATION OF RESOURCE POTENTIAL

Until the 1960's no comprehensive evaluation of resource potential had been undertaken for the Eastern Slopes. Now a research group whose members are drawn from provincial government agencies is preparing the Foothills Resource Allocation Study. The most significant purpose of this Study is said to be "to provide the Government of Alberta with a design for the most beneficial allocation of resources in the Foothills Region".[1]

For the purpose of the Study the Foothills Region has been subdivided into planning units called Drainage Districts. In the first phase of the Study there is an assessment of the resource potential and a compilation of current land uses.

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[1] Alberta, Dept. of Lands and Forests, 1972. "Kananaskis-Spray Drainage District, Phase 1, Preliminary Analysis".

Five maps are being prepared by the Study group for each drainage district. The researchers suggest that by showing only resource potential this part of the Study will provide some idea as to how "alternative developments may proceed while ensuring a suitable utilization of available physical resources".[1]

The first map shows preferred renewable natural resources as established by the Canada Land Inventory. Additional information is provided on secondary resources, resource compatibility and the quality of the resources.

The second map includes preferred non-renewable resources as well as forest cover, hydrology, grazing capability, archaeology and key ungulates (Fig. 8). The third map shows present land use. The fourth map shows resource allocation according to potential, use and compatibility. The final map is a recommended management zone map based upon a five-zone system (Table 1). At this time only the preliminary map for the Kananaskis-Spray district is available (Fig. 9).

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[1] *Ibid.*

There are three subsequent phases to the Study. Phase II defines and measures the general economic capability of the foothills region. Phase III projects what levels of demand will be placed on the foothills resources during the coming decade. The final phase consists of an interdisciplinary analysis of resource development alternatives.

The ultimate goal of the Study "is a regional land use plan determined by resource potential, supply-demand analysis and resource development alternatives subject to revisions in present land commitments and policy".[1]

The Foothills Resource Allocation Study is important in two senses. First, it represents the only attempt to evaluate all recognized renewable and non-renewable natural resources from the standpoint of long-term planning. Secondly, in whatever form its final recommendations are shaped, these may have a significant influence on government policy and planning. Public evaluation of the criteria used in the Study and of the results obtained is therefore of considerable importance.

Individuals, private interests and citizens organizations are also providing recommendations on the management and

[1] *Ibid*.

use of select resources or of specific geographical areas. Recent examples include briefs submitted to public hearings on coal strip mining and recommendations for a recreational wilderness in the Elbow-Sheep district.

Some degree of public dissatisfaction with the standards established for an improved section of the Kananaskis Highway represents another type of evaluation of ongoing developments.

TABLE 1

PRELIMINARY LAND USE PLAN (F.R.A.S.)

I. Land Use Zones

1. Special Use
    - a. Indian Reservation
    - b. Metis Colony
    - c. Wilderness Area
    - d. Natural Area
    - e. Research Area
    - f. Other Special Areas
    - g. Freehold Land
    - h. Transportation Corridor
        - i. Major
        - ii. Minor

2. Development Node
    - a. Urban Development
    - b. Residential
    - c. Commercial
    - d. Institutional
    - e. Industrial

II. Resource Management Zones

3. Conservation Zones
    - a. Archaeological Zone
    - b. Watershed Management Zone
    - c. Big Game Management Zone
    - d. Waterfowl Management Zone
    - e. Recreation Management Zone

4. Subsurface Resource Zone
    a. Coal Management Zone
    b. Oil and Gas Management Zone
    c. Metallic Mineral Management Zone
    d. Industrial Mineral Management Zone

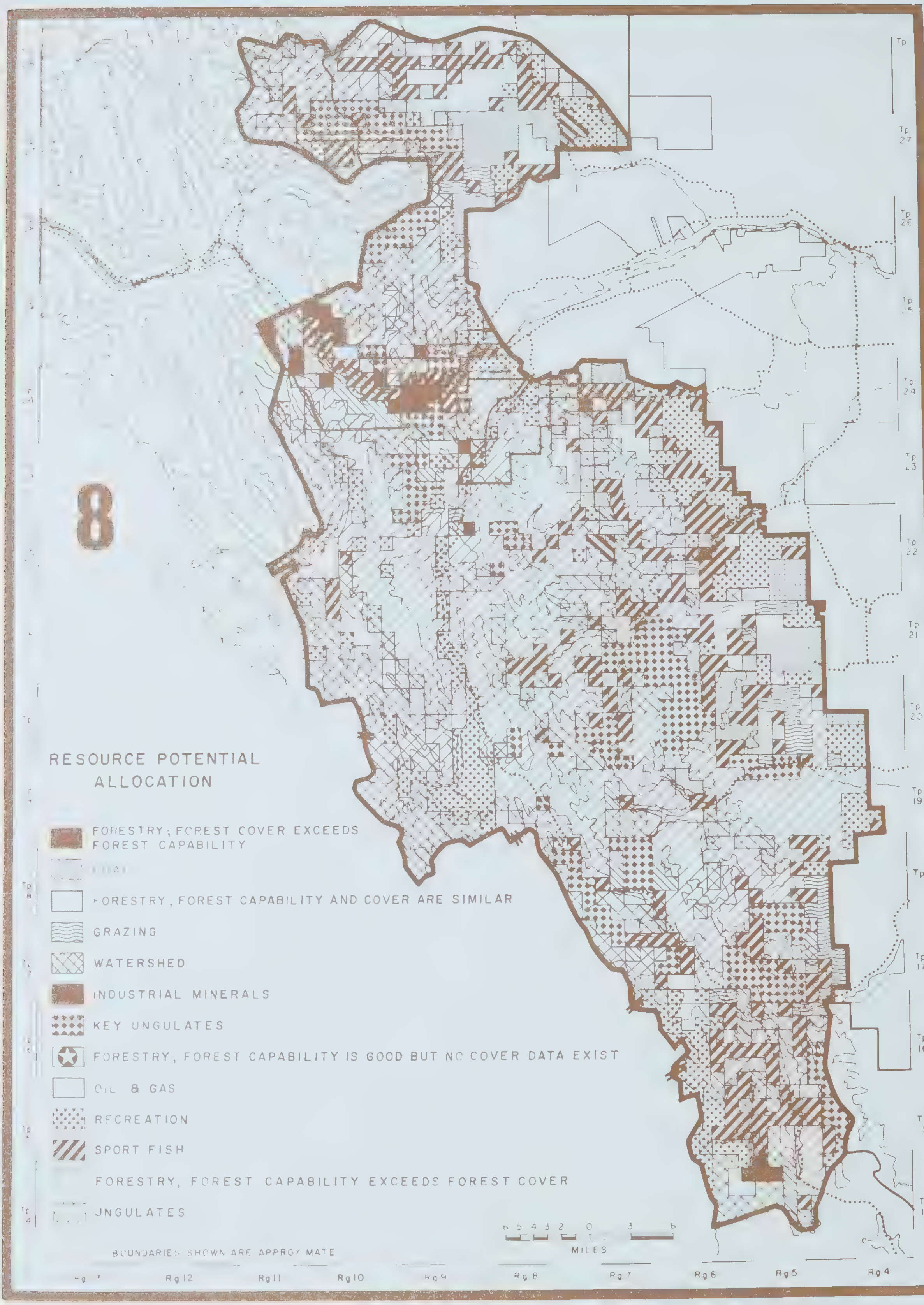
5. Surface Resource Zone
    a. Recreational Development Zone
    b. Timber Development Zone
    c. Agriculture Development Zone
    d. Forage Development Zone

7. PLANNING FOR THE FUTURE

Decisions respecting future land use and resource development in the Bow River Watershed basin are being made at a time of considerable social change in Canada. As has happened elsewhere in North America the population of Alberta has become highly urbanized. By 1981 the Province and the City of Calgary may have over two million and half a million residents respectively. Most of Alberta's major cities lie relatively close to the foothills and Rocky Mountains and look to these regions for a variety of recreational activities.

While national parks absorb much of this recreational use, their very popularity for this purpose threatens the natural character of wildland landscapes and ecosystems. Limits on both the type of recreation and number of recreationists can be anticipated.

The foothills region and the Front Ranges with their varied scenery and numerous opportunities for both facilities and non-facilities-oriented recreation provide a major potential for future outdoor recreation. In the case of the study area, it lies in Calgary's day-use recreational zone. A belt of private lands and limited public recreation facilities closer to the city emphasizes the area's importance for recreation.


8
RESOURCE POTENTIAL ALLOCATION
FORESTRY; FOREST COVER EXCEEDS FOREST CAPABILITY
COAL
FORESTRY, FOREST CAPABILITY AND COVER ARE SIMILAR
GRAZING
WATERSHED
INDUSTRIAL MINERALS
KEY UNGULATES
FORESTRY; FOREST CAPABILITY IS GOOD BUT NO COVER DATA EXIST
OIL & GAS
RECREATION
SPORT FISH
FORESTRY, FOREST CAPABILITY EXCEEDS FOREST COVER
UNGULATES
BOUNDARIES SHOWN ARE APPROXIMATE
6 5 4 3 2 0 3 6
MILES
Rg 12
Rg 11
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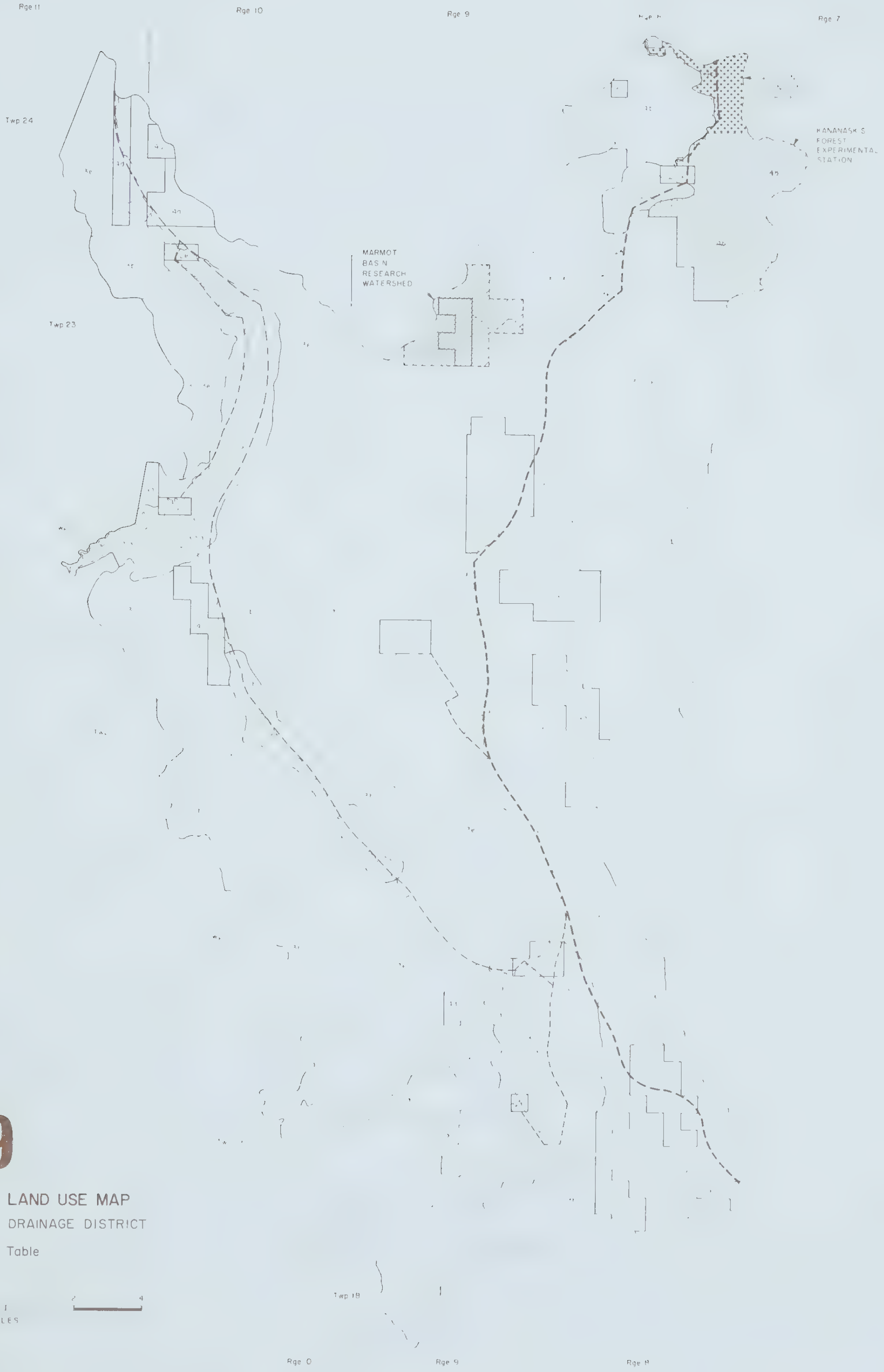
Rge 11
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Rge 7
Twp 24
Twp 23
MARMOT BASIN RESEARCH WATERSHED
KANANASKIS FOREST EXPERIMENTAL STATION
40
40
Twp 18
Rge 10
Rge 9
Rge 8

9

PRELIMINARY LAND USE MAP

KANANASKIS-SPRAY DRAINAGE DISTRICT

KEY - See Table

Recreation need not be incompatible with other land uses in the area. However, the social and economic benefits and costs of all types of resource development must be examined. For instance, to what extent are some present land uses being subsidized by existing practices and fee structures?

A series of questions may be posed concerning future land use and resource development policy in the Bow River Watershed basin.

1. What should be the guiding principles in planning future land use and landscape in the area?
2. What criteria should be selected in stating preferences between uses? Should the area continue to be planned and managed on a multiple-use basis?
3. What aspects of research (ecological, archaeological, economic, etc.) are most urgently required in the area prior to the preparation of long-range plans?
4. What techniques of analysis (e.g. benefit-cost) should be employed in assessing the respective values of different land uses and resources? Are present methods of analysis adequate? How effective is zoning to long-range planning?
5. How important, socially and economically, are the resources of this area when compared to similar resources elsewhere in Alberta and Canada? How significant are proposals for land use and resource development in Banff National Park, the Stony Indian Reserve, the City of Calgary and other nearby areas when planning the future use of the study area?
6. Is there a need for some type of regional plan which will enunciate long-range land use and management strategies for the Bow River Watershed basin? Should there be public hearings on such a plan?

7. What prospects exist for increasing the resource potential of the area by means such as the establishment of game reserves and fish ponds?
8. Which agencies should be responsible for the administration of land use and resource development? Is there a need for an independent review agency to monitor and evaluate land management in the Eastern Slopes?
9. What are the merits of establishing a permanent road system in the area?
10. What types of outdoor recreation should be permitted and encouraged?

The Canmore Corridor perhaps best exemplifies the many problems concerning land use planning. The Corridor has a mix of land uses. It has mineral, sand and gravel, forage and recreational resource potential. There is a mixture of private and public lands. There are plans to expand the industrial, commercial and residential facilities in the Corridor. The growth in popularity of Banff National Park has influenced land use development in the Canmore Corridor.

Given this existing pattern of land use, resource development and land disposition in the Corridor, what strategies would best suit its future development? If, for example, the parent company of Canmore Mines Ltd. decided to engage upon extensive recreational developments, what changes might this necessitate in provincial policy for land use in the Corridor? Should the Corridor develop a greater number of recreational service facilities and thus alleviate development pressures in Banff National Park? What would be the effects of changes in provincial land use policy in the Corridor upon the economy of Canmore and other communities? If land use zoning is introduced in the Canmore Corridor how many zones should there be?

Answers to these and other questions in the Canmore Corridor and elsewhere in the study area will help to determine which development strategies should be adopted.

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9. MAPS

Many of the references cited in the Bibliography contain detailed maps of the geography, resources and development of the Bow River Watershed Basin. In addition the following maps of the study area and adjacent lands may be of assistance in the preparation of submissions.

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Location	Name	Scale	Year
82 - J	Kananaskis Lakes	1/250,000	1960
82 - 0	Calgary		1967
82 - J NW	Palliser-Kananaskis	1/126,720	1923
82 - J 07E	Mount Head	1/50,000	1954
82 - J 07W	Mount Head		1961
82 - J 09	Turner Valley		1955
82 - J 10E	Dyson Creek		1943
82 - J 10W	Mount Rae		1954
82 - J 11	Kananaskis Lakes		1967
82 - J 12E	Tangle Peak		1966
82 - J 12W	Tangle Peak		1966
82 - J 13E	Mount Assiniboine	1/50,000	1966
82 - J 13W	Mount Assiniboine		1966
82 - J 14E	Evans-Thomas Creek		1954
82 - J 14W	Spray Lake		1960
82 - J 15E	Bragg Creek		1940
82 - J 15W	Moose Mountain		1940
82 - 0 02E	Jumping Pound		1931
82 - 0 02W	Morley		1935
82 - 0 03E	Canmore		1959
82 - 0 03W	Canmore		1959
82 - 0 04E	Banff		1959
82 - 0 04W	Banff		1959
82 - 0 06E	Lake Minnewanka		1958
82 - 0 06W	Lake Minnewanka		1958
82 - 0 07E	Wildcat Hills		1960
82 - 0 07W	Wildcat Hills		1960
82 - 0 11E	Burnt Timber Creek		1963
82 - 0 11W	Burnt Timber Creek		1963
82 - 0 12E	Barrier Mountain		1960
82 - 0 12W	Barrier Mountain		1960

* For additional information on maps see the Branch's Catalogue of Published Maps, 1970. Ottawa.

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